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THE UNITED STATES PATENT AND TRADEMARK OFFICE  
Re: Appeal to the Board of Appeals

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SEP 16 2003  
TC 1700

#16  
CMT  
9-17-03

In re Application of

BRUCHMANN et al.

Serial No. 09/726,045

Filed: November 30, 2000

Art Unit: 1751

Examiner: Kumar

For: BUILDING BLOCKS CONTAINING ISOCYANATE GROUPS AND THEIR USE FOR  
FUNCTIONALIZING OR MODIFYING COMPOUNDS OR SURFACES

To: Hon. Commissioner of Patents and Trademarks

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner of Patents and Trademarks, Washington, D. C. 20036, on:

Date of Deposit September 11, 2003  
Person Making Deposit Herbert B. Keil  
Signature Herbert B. Keil  
Date of Signature September 11, 2003

1. ☐ NOTICE OF APPEAL: Applicant hereby appeals to the Board of Appeals from the decision dated \_\_\_\_ of the Primary Examiner finally rejecting claims \_\_\_\_.
2. ☐ A check in the amount of \$ \_\_\_\_ is attached to cover the required extension of time fee.
3. ☒ BRIEF on appeal in this application is transmitted herewith.
4. ☐ An Oral Hearing is requested.  
☐ The Oral Hearing fee of \$280.00 is enclosed.
5. ☒ Fee \$320.00  
☒ Enclosed
6. ☒ The Commissioner is hereby authorized to charge any fees which may be further required, or credit any over payment to Account No. 11-0345. A duplicate copy of this sheet is attached.

Respectfully submitted,  
KEIL & WEINKAUF

HBK/kas

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By Herbert B. Keil  
Herbert B. Keil  
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PATENT & TRADEMARK OFFICE

Art Unit: 1751

Examiner: Kumar

Honorable Commissioner of  
Patents and Trademarks  
Washington, D.C. 20231

Sir:

REAL PARTY IN INTEREST

The real party in interest is BASF Aktiengesellschaft of Ludwigshafen, Germany.

Reel 011359, Frame 0042, recorded on November 30, 2000.

To appellants' knowledge and belief, there are no interferences or other appeals within the meaning of 37 CFR § 1.912(c).

320.00 EP

The claims in the application are claims 1-13. Claims 1-5, 7, 9 and 10 have

been withdrawn from consideration. Claims 6, 8 and 11-13 have been finally rejected under 35 USC § 103 as being unpatentable over each of Matsuda et al., US 4,008,196 (Matsuda) and Kim et al., US 4,180,491 (Kim), each taken individually.

### STATUS OF AMENDMENTS

The claims have not been amended subsequent to the final rejection.

### SUMMARY OF INVENTION

The invention is a process for functionalizing or modifying compounds or surfaces having at least one group which is reactive toward isocyanate by causing them to react with a compound of the formula I



which is defined in claim 6. The compounds of formula I can be viewed as “building blocks” and are used to functionalize or modify various compounds or surfaces which have isocyanate reactive groups. In claim 6, Y may also be an isocyanate group, but it is the nature of the compound of formula I as defined that the isocyanate group bonded to R<sup>1</sup> that is initially reactive.

The process is particularly useful for modifying surfaces which have groups reactive toward isocyanate to custom build surfaces which are reactive to other groups through the functional groups Y or to modify the hydrophilicity of such surfaces.

### ISSUES

Would the subject matter of claims 6, 8 and 11-13 have been obvious within the meaning of 35 USC § 103 from the individual disclosures of Matsuda and Kim?

### GROUPING OF CLAIMS

The claims have not been argued separately.

### ARGUMENT

The following legal authorities are relied on in the following argument in the order in which they are cited:

*Ex parte Levengood*, 28 USPQ2d 1300 (BPAI 1993).

### THE REFERENCES

Matsuda discloses a process for the production of an amphoteric resinous aqueous solution that is useful for the treatment of fiber containing products. Said process comprises the following steps:

- producing an NCO containing prepolymer,
- reacting said prepolymer with a polyamine, wherein the resulting polymer contains -NH<sub>2</sub> groups but does not contain any free NCO groups,
- partially reacting the -NH<sub>2</sub> groups containing prepolymer with an alkyl-monoisocyanate in order to get a polymer having NH<sub>2</sub>-groups and long chain alkyl groups, but no free NCO groups,

- reacting the thus-formed product with, e.g., caprolactone,
- emulsifying the above obtained polymer in water and treating fibers with the resulting emulsion.

The process of Matsuda is totally different from the process of the instant claims.

As can be seen from the above description, only the first step of the Matsuda process utilizes an NCO containing reactant. However, that reactant is quite different from appellants' compound (1). Thus, to whatever extent the examiner may be equating the first step of the Matsuda process to the process of the instant claims, that equation would be erroneous on its face.

Matsuda does not teach a process for modifying compounds or surfaces by causing them to react with a polyfunctional isocyanate such as instant compound (1). The only surface modifying composition disclosed by Matsuda has long since had its free NCO groups converted to other groups in the formation of the actual modifying composition.

To find in the disclosure of Matsuda any suggestion of the instant invention and/or motivation to use it would require an incredible leap of the imagination. The requirements for establishing a *prima facie* case of obviousness over the prior art are set forth in MPEP §§ 706.02(j) and 2141-2143.03, and the cases cited therein. For a good explanation of the type of reasoning required to be set forth by an examiner to support a *prima facie* case of obviousness, see *Ex parte Levengood*, 28 USPQ2d 1300 (BPAI 1993). Neither sufficiently relevant teachings in Matsuda nor an appropriate

explanation of how the Matsuda teachings could properly give rise to a *prima facie* case of obviousness are to be found on the present record.

The examiner has speculated that in Matsuda the urethane prepolymer is ultimately produced from appellants' claimed isocyanates. The examiner has apparently confused the isocyanate prepolymer polyfunctional NCO termini with the here claimed monofunctional building blockings. The functionality here under discussion is the OCN-R<sup>1</sup>- terminus. Isocyanate monofunctionality is inherent as discussed above and also in view of the discussion of the prior art and applicants' goals. However, even where y is an isocyanate and one should not understand that it must be relatively unreactive in the claimed invention, there could still be no *prima facie* case of obviousness of record. There is no hint of the concept of the invention here claimed in Matsuda.

In Matsuda, the surface modification of molecules follows the joining of alkyl chains either through alkylmonoisocyanate, which is not within the instant claims, or through epoxides. The examiner's speculation is further improper because one of ordinary skill in the art of chemistry recognizes that there will be a significant difference if one prepares an alkylisocyanate from a monoamine or produces such a product from one to one addition of diisocyanate with a mono- or polyfunctional isocyanate component. Matsuda does not explicitly disclose the one to one reaction and an unruly mixture of different and not clearly defined products is obtained.

Kim discloses print pastes comprising a thickener concentrate containing a nonionic polyurethane having at least 3 hydrophobic branching groups linked through hydrophilic polyether segments. However, the polymers disclosed in Kim do not contain any free isocyanate groups (see col. 4, "the ratio of total equivalents of active hydrogen containing reactants to isocyanate reactants is at least 1:1. A slight excess ... may be used to eliminate any unreacted isocyanate functionality").

Kim describes the preparation of an isocyanate-free thickener through the transformation of, for example, long chain polyetherols with alkylisocyanate, for example, octadecylisocyanate. The present claims do not include that type of isocyanate.

Kim concerns a typical end cap of a di- or trifunctional alcohol with alkyl chains toward the production of a "soap." In the examiner's quoted example 40 no "polybranched" polymer is produced, but simply a diurethane of a PEG. That is quite remote from the here claimed subject matter.

The disclosure of Kim is clearly even more remote from the claimed invention than is that of Matsuda and a suitable explanation based on logic and sound scientific reasoning as to how one of ordinary skill in the relevant art would have derived appellants' invention from that disclosure is even more clearly required.

Appellants invention permits a made-to-order modification of compounds or polymers to render them more or less hydrophobic or hydrophilic and modify their reactivity. There is no suggestion in either reference how to produce such made-to-

order modification.

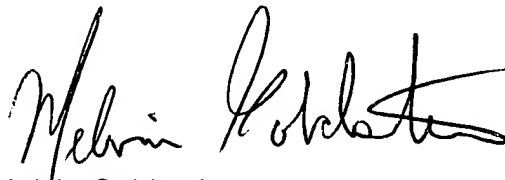
CONCLUSION

For the foregoing reasons, it is respectfully submitted that reversal of the examiner's rejection of claims 6, 8 and 11-13 is in order.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees to Deposit Account No. 11.0345. Please credit any excess fees to such deposit account.

Respectfully submitted,

KEIL & WEINKAUF

A handwritten signature in black ink, appearing to read 'Melvin Goldstein', with a stylized, flowing script.

Melvin Goldstein  
Reg. No. 41,560

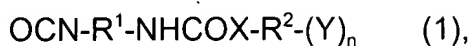
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## APPENDIX

1. **(withdrawn)** A compound of the formula 1,



where  $\text{R}^1$  and  $\text{R}^2$  are each a substituted or unsubstituted, linear or branched, saturated or unsaturated alkylene radical having from 1 to 20 carbon atoms, a substituted or unsubstituted, saturated or unsaturated cycloalkylene radical having from 3 to 20 carbon atoms, a substituted or unsubstituted arylene radical having from 3 to 20 carbon atoms, an arylenealkylene radical having from 4 to 20 carbon atoms, a heterocyclic radical or any linear or branched sequence of two or more of the radicals mentioned, if desired linked via ether, thioether, ester, amine or amide structures, X is a covalent bond to  $\text{R}^2$  or O, S or  $\text{NR}^3$ , where  $\text{R}^3$  is a hydrogen atom or a substituted or unsubstituted, linear or branched, saturated or unsaturated alkyl radical having from 1 to 20 carbon atoms, a substituted or unsubstituted, saturated or unsaturated cycloalkyl radical having from 3 to 20 carbon atoms, a substituted or unsubstituted aryl radical having from 3 to 20 carbon atoms, a heterocyclic radical or any linear or branched sequence of two or more of the radicals mentioned, Y is a hydrogen atom or a free functional group and n is an integer from 1 to 20.

2. **(withdrawn)** A compound as claimed in claim 1, wherein Y is a free functional group selected from the group consisting of hydroxyl, amino, amido, carbonyl, carboxyl,

mercapto, sulfonyl, sulfinyl, sulfenyl, sulfate, nitro, nitrile, isonitrile, cyanate, silyl, silanyl, phosphine, phosphate, phosphite, phosphonate, acrylate, methacrylate, allyl and vinyl and mixtures thereof.

3. **(withdrawn)** A compound as claimed in claim 1, wherein the radical R<sup>1</sup> is selected from the group consisting of 2,4-tolylene, 2,6-tolylene, 4,4'-diphenylmethylene, 2,4'-diphenylmethylene, 3-alkyl-4,4'-diphenylmethylene, where alkyl is C<sub>1</sub>-C<sub>10</sub>-alkyl, 1,3- and 1,4-phenylene, 1,5-naphthylene, tolidinylene, biphenylene, tetramethylene, hexamethylene, dodecylene, alkyl pentamethylene-2-carboxylate, where alkyl is C<sub>1</sub>-C<sub>10</sub>-alkyl, isophoronylene, 2-methylpentamethylene, 2,2,4- and 2,4,4-trimethyl-1,6-hexamethylene, 1,3- and 1,4-cyclohexylene, 3-methylene-1-methyl-1-cyclohexylene, 2-butyl-2-ethylpentamethylene, 4-methyl-1,3-cyclohexylene, 4,4'- and 2,4'-methylenebis(cyclohexylene), xylylene, tetramethylxylylene and mixtures thereof.

4. **(withdrawn)** A process for preparing a compound of the formula 1



by reacting a diisocyanate of the formula 2



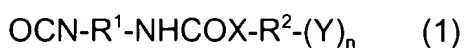
with a compound of the formula 3



where R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, X, Y and n are defined as in claim 1 and X in formula 3 can

also be OCO.

5. **(withdrawn)** A process as claimed in claim 4, wherein the diisocyanate of the formula 2 is selected from the group consisting of 2,4-tolylene diisocyanate, 2,6-tolylene diisocyanate, diphenylmethane 4,4'-diisocyanate, diphenylmethane 2,4'-diisocyanate, 3-alkyldiphenylmethane 4,4'-diisocyanate, where alkyl is C<sub>1</sub>-C<sub>10</sub>-alkyl, phenylene 1,3- and 1,4-diisocyanate, naphthylene 1,5-diisocyanate, tolidine diisocyanate, biphenyl diisocyanate, tetramethylene diisocyanate, hexamethylene diisocyanate, dodecylene diisocyanate, lysine alkyl ester diisocyanate, where alkyl is C<sub>1</sub>-C<sub>10</sub>-alkyl, isophorone diisocyanate, 2-methylpentamethylene diisocyanate, 2,2,4- and 2,4,4-trimethylhexamethylene 1,6-diisocyanate, 1,4-diisocyanatocyclohexane, 3-isocyanatomethyl-1-methyl-1-isocyanatocyclohexane, 2-butyl-2-ethylpentamethylene diisocyanate, 2-isocyanatopropylcyclohexyl isocyanate, 4-methylcyclohexane 1,3-diisocyanate, dicyclohexylmethane 4,4'- and 2,4'-diisocyanate, 1,3- and 1,4-bis(isocyanatomethyl)cyclohexane, xylylene diisocyanate and tetramethylxylylene diisocyanate and mixtures thereof.
6. **(original)** A process for functionalizing or modifying compounds or surfaces having at least one group which is reactive toward isocyanate, by reacting a compound of the formula 1



where R<sup>1</sup> and R<sup>2</sup> are each a substituted or unsubstituted, linear or branched

saturated or unsaturated alkylene radical having from 1 to 20 carbon atoms, a substituted or unsubstituted, saturated or unsaturated cycloalkylene radical having from 3 to 20 carbon atoms, a substituted or unsubstituted arylene radical having from 3 to 20 carbon atoms, an arylenealkylene radical having from 4 to 20 carbon atoms, a heterocyclic radical or any linear or branched sequence of two or more of the radicals mentioned, if desired linked via ether, thioether, ester amine or amide structures, X is a covalent bond to  $R^2$  or O, S or  $NR^3$ , where  $R^3$  is a hydrogen atom or a substituted or unsubstituted, linear or branched, saturated or unsaturated alkyl radical having from 1 to 20 carbon atoms, a substituted or unsubstituted, saturated or unsaturated cycloalkyl radical having from 3 to 20 carbon atoms, a substituted or unsubstituted aryl radical having from 3 to 20 carbon atoms, a heterocyclic radical or any linear or branched sequence of two or more of the radicals mentioned, Y is a hydrogen atom or a free functional group and n is an integer from 1 to 20, with at least one isocyanate-reactive group of a compound having at least one isocyanate-reactive group, or with at least one isocyanate-reactive group on a surface.

- 7. (withdrawn)** A process as claimed in claim 6, wherein Y is a free functional group selected from the group consisting of hydroxyl, amino, amido, carbonyl, carboxyl, mercapto, sulfonyl, sulfinyl, sulfenyl, sulfate, nitro, nitrile, isonitrile, cyanate, silyl, silanyl, phosphine, phosphate, phosphite, phosphonate, acrylate, methacrylate,

allyl and vinyl and mixtures thereof.

8. **(original)** A process as claimed in claim 6, wherein the compound which has at least one group which is reactive toward isocyanate is a monomer, polymer, dendrimer, hyperbranched polymer or star polymer containing at least one group which is reactive toward isocyanate.
9. **(withdrawn)** A process as claimed in claim 8, wherein the monomer which has at least one group which is reactive toward isocyanate is selected from the group consisting of ethylene glycol, propylene glycol, butanediol, pentanediol, hexanediol, glycerol, trimethylolpropane, pentaerythritol, sorbitol, sugar, ethylenediamine, butylenediamine, hexylenediamine and melamine.
10. **(withdrawn)** A process as claimed in claim 8, wherein the polymer having at least one group which is reactive toward isocyanate is selected from the group consisting of polyether polyols, polyester polyols, polyacrylate polyols, polyvinyl alcohols, polyalkylenimines, polyalkyleneamines, polyamidoamines, polyacrylic acids and polymers bearing acid anhydride groups.
11. **(original)** A process as claimed in claim 6, wherein the surface which has at least one group which is reactive toward isocyanate is a surface of wood, glass, textiles, ceramic materials, leather, paper, plastic, stone, concrete, metals or metal alloys, with the proviso that these surfaces have at least one group which is reactive toward isocyanate.
12. **(original)** A process as claimed in claim 6, wherein the group which is reactive

toward isocyanate is selected from the group consisting of hydroxyl, amino, amido, carboxyl and mercapto and mixtures thereof.

13. **(original)** A process as claimed in claim 8, wherein the group which is reactive toward isocyanate is selected from the group consisting of hydroxyl, amino, amido, carboxyl and mercapto.